What is claimed is:

1. A method for removing show-through image information from image data generated by scanning a duplex printed document adjacent another document comprising:

receiving the image data for a front side and a back side of the document and an adjacent side of the other document;

determining scanned density data for the front side and effective absorbency data for the combined back and adjacent sides from the received image data;

determining show-through compensated density data for the front side image from the received image data, the scanned density data and the effective absorbency data.

2. The method of claim 1, further comprising transforming the show-through compensated density data for one or all of the images into show-through compensated reflectance image data.

3. The method of claim 1, wherein determining the show-through compensated density data includes:

spatially filtering the effective absorbency data for at least one of the back or adjacent images; and

subtracting the spatially filtered absorbency data from the scanned density data for the front side image.

4. The method of claim 3, wherein the spatial filtering includes using a filter corresponding to a pre-determined show-through point spread function.

5. The method of claim 3, wherein the spatial filtering uses a filter corresponding to a show-through point spread function estimated from the scanned data for the three sides.

6. The method of claim 5, wherein the spatial filtering is performed using a digital filter.

7. The method of claim 6, wherein the digital filter is an adaptive filter.

8. The method of claim 1, wherein determining the scanned density data for the sides comprises determining a logarithm (or approximation thereof) of the ratio of the received image data for a region of the image bearing substrate containing an image and for a region of the image bearing substrate having no image on either the front or the back sides.

9. The method of claim 1, wherein the scanned density of the front side is determined using the relationship:

$$D_1^s(x,y) = -\ln (R_1^s(x,y)/R_p^w)$$

where ln() denotes the natural logarithm.

10. The method of claim 1, wherein the absorbency of the back and adjacent sides is approximated using the relationship:

$$A_{23}^e(x,y) \equiv [1-T_2^2(x,y)T_3^s(x,y)]$$

where $T_3^s(x,y)$ and $T_2^2(x,y)$ are obtained from the scanned data as $T_3^s(x,y) \equiv R_3^s(x,y)/R_p^w$ and $T_2^2(x,y) \approx R_2^s(x,y)/R_p^w$.

11. The method of claim 1, wherein the show-through compensated density data is determined using the relationship:

$$D_1(x,y) = D_1^s(x,y) - H(x,y) * A_{23}^e(x,y).$$

12. A show-through image information removal apparatus for removing show-through image information from image data generated by scanning an image bearing substrate having a front side image and a back side image, wherein the substrate is adjacent a backing comprising an adjacent side image comprising:

an input/output interface;

a memory; and

a show-through image information compensation device; wherein: image data for the front side image, the back side image and the adjacent side image is received through the input/output interface and stored in the memory, and the show-through compensation device determines scanned density data for the front-side and

approximate absorbency data for the combination of the back and adjacent side images from received image data for the front side image, the back side image and the adjacent side image and determines show-through compensated density data for the front side image based on the scanned density data and the approximate absorbency data.

13. The apparatus of claim 12, further comprising a data alignment circuit for aligning image data of the front, back and adjacent side images.

14. The apparatus of claim 13, wherein the show-through image information compensation device comprises:

means for determining scanned density data for the front side image from the received image data for the front side image;

means for approximating an absorbency of the combination of back and adjacent sides and estimating a show-through point spread function;

means for determining show-through compensated density data for the front side from the scanned density data, the approximated absorbencies and the estimated show-through point spread function.

15. The apparatus of claim 14, wherein the show-through correction is based on a linearized relationship between the image data for the front, back and adjacent sides.

16. The apparatus of claim 14, wherein the estimated show-through point-spread function is estimated using a digital filter.

17. The apparatus of claim 16, wherein the digital filter is an adaptive filter.

18. The apparatus of claim 14, wherein the show-through image information compensation device determines the scanned density data by determining a logarithm of a ratio of the received image data of a region having an image on the image bearing substrate and received image data of a region having no image on the image bearing substrate.

19. The apparatus of claim 12, wherein the normalized reflectance of the back side image is determined by the show-through image information compensation device using the relationship:

$$T_3^s(x,y) \equiv R_3^s(x,y)/R_p^w.$$

20. The apparatus of claim 12, wherein the absorbency of the combination of back and adjacent sides is approximated by the show-through image information compensation device using the relationship:

$$A_{23}^e(x,y) \equiv [1-T_2^2(x,y)T_3^s(x,y)]$$

where $T_3^s(x,y)$ and $T_2^2(x,y)$ are obtained from the scanned data as $T_3^s(x,y) \equiv R_3^s(x,y)/R_p^w$ and $T_2^2(x,y) \approx R_2^s(x,y)/R_p^w$.

21. The apparatus of claim 12, wherein the show-through image information compensation device determines show-through compensated density data by determining the show-through compensated density data using the relationship:

$$D_1(x,y) = D_1^s(x,y) - H(x,y) * A_{23}^e(x,y).$$

22. An image forming device including the show-through image information removal apparatus of claim 12.

23. A method for removing show-through image information from image data generated by scanning a duplex printed document, wherein the show-through compensation is based on a linearized relationship between the scanned data for the front, back and adjacent side images, and wherein the front side image data is in density space.